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ICE IN THE ANTARCTIC POLAR STRATOSPHERE

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ABSTRACT

On six occasions during the 1987 Airborne Antarctic Ozone Experiment, the PSC ice crystals were replicated over the Palmer Peninsula at approximately 70° South. The sampling altitude was approximately 60 to 65 thousand feet, the temperature range was -83.5°C to -72°C and the atmosphere was subsaturated in all cases. The collected crystals were predominantly complete and hollow prismatic columns with maximum dimensions up to 217 microns. Evidence of scavenging of submicron particles was detected on several crystals. While the replicated crystal sizes were larger than anticipated, their relatively low concentration results in a total surface area less than one tenth that of the sampled aerosol particles. The presence of large crystals (length > 100 microns) suggest that PSC ice crystals can play a very important role in stratospheric dehydration processes.